CLAIMS

What is claimed is:

1. A method for performing photonic constant envelope modulation (CPM), the method comprising:

generating, from an input coherent optical signal, a frequency shifted optical signal;

generating, from the input coherent optical signal, a pure phase modulated optical signal, the phase modulation corresponding to an information data stream; and

generating a pure phase modulated photocurrent signal, the phase modulation corresponding to the information data stream;

wherein introducing the CPM onto the optical signal increases the upper limit on data rates and throughput capacity.

2. The method according to claim 1, further comprising:

generating a first optical signal and a second optical, wherein the first optical signal and the second optical signal each represent nominally one half of an input optical signal.

3. The method according to claim 2, wherein the step of generating the frequency shifted optical signal consists of diffracting the first optical signal with an acoustic wave of a carrier signal.

4. The method according to claim 4, wherein the carrier signal is one of: IF and RF frequency.

5. The method according to claim 2, wherein the step of generating the pure phase modulated optical signal includes passing the second optical signal through an electro-optically active medium subject to an electric field containing an information data stream.

6. The method according to claim 2, further comprising generating two superposed optical signals.

7. The method according to claim 6, wherein generating the two superposed optical signals include superposing the pure phased modulated signal and the frequency shifted optical signal.

8. The method according to claim 6, wherein two superposed optical signals are phase shifted from one another by $\pi/2$.

9. The method according to claim 7, wherein the step of generating the pure phased modulated photocurrent signal includes generating separate photcurrents for each of the two superposed optical signals.

10. The method according to claim 9, further comprising:

removing a DC current from the pure phase modulated photocurrent signal.

11. A system for performing photonic constant envelope modulation, the system comprising:

a first modulator operable to generate a frequency shifted optical signal;

a second modulator operable to generate a pure phase modulated optical signal; and

a set of detectors operable to generate a pure phase modulated photocurrent signal corresponding to an information data stream;

wherein the photonic implementation of CPM allows modulation in high data rate applications by increasing the upper limit on data rates and throughput capacity by performing the modulation functions on optical frequency signals..

12. The system according to claim 11, further comprising:

a splitter, coupled to an input of the first modulator and an input of the second modulator, operable to generate a first optical signal and a second optical, wherein the first optical signal and the second optical signal each represent nominally one half of an input optical signal.

13. The system according to claim 12, wherein the first modulator diffracts the first optical signal with an acoustic wave of a carrier frequency signal.

14. The system according to claim 13, wherein the first modulator selects a propagation direction with respect to the propagation direction of the carrier frequency acoustic wave for the first optical signal.

15. The system according to claim 14, wherein the carrier signal is one of: IF or RF.

16. The system according to claim 12, wherein second modulator provides an electric field provided with an information data stream for phase modulating the second optical signal.

17. The system according to claim 11, further comprising a coupler, coupled to an output of the first modulator and an output of the second modulator, operable to generate two superposed optical signals.

18. The system according to claim 17, wherein each of the two superposed optical signals include the pure phase modulated signal and the frequency shifted optical signal.

19. The system according to claim 18, wherein the two superposed optical signals are phased from one another by $\pi/2$.

20. The system according to claim 19, the set of detectors operable to generate a photocurrent for each of the two superposed optical signals.

21. The system according to claim 11, further comprising:

a filter, coupled to the set of detectors, operable to remove a residual DC current from the pure phase modulated photocurrent signal.